Sustainable Water Management Initiative

# Advisory Committee

Presentation Title: Stream Categorization:
Describing the Current Condition

Presented By: Todd Richards
Division of Fish and Wildlife

Date of Presentation: September 1, 2010

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This presentation is not to be cited as a reference. It's purpose is to foster open and broad discussion of the issues as well as help assure public awareness of the discussions as of the date of the presentation.

# Stream Categorization: Describing the Current Condition

# Categorization

- Statewide Screening Tool
- Describe the Current Condition
- Using Best Available Science
- Living Document
- Useful Tool for Discussion of:
  - Goal Setting
  - Streamflow Criteria
  - Safe Yield

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# Fish Communities

- The Fish Tell the Story
  - Long-lived
  - Reflect stresses over time
  - Easily recognized and identified
  - Well-studied
  - Good indicators of the condition of the aquatic environment

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# Rivers Should Have River Fish Communities

## What is  a River Fish?

Brook Trout

Fallfish

Creek Chubsucker

Tesselated Darter

Common Shiner

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# *Preliminary Assessment of Factors Influencing Riverine Fish Communities in Massachusetts*

by

David Armstrong
Sara Brandt

*U.S. Geological Survey*
*Massachusetts-Rhode Island Water Science Center*

and

Todd Richards
*Massachusetts DFW*

USGS
science for a changing world

In cooperation with the
Massachusetts Department of Conservation and Recreation,
The Massachuetts Department of Environmental Protection, and the
Massachusetts Department of Fish and Game

Preliminary assessment of factors influencing riverine fish communities in Massachusetts

By David S. Armstrong, Sara L. Brandt, Todd A. Richards, and Matt Baker?

Open File Report 201X-XXX

U.S. Department of the Interior
U.S. Geological Survey

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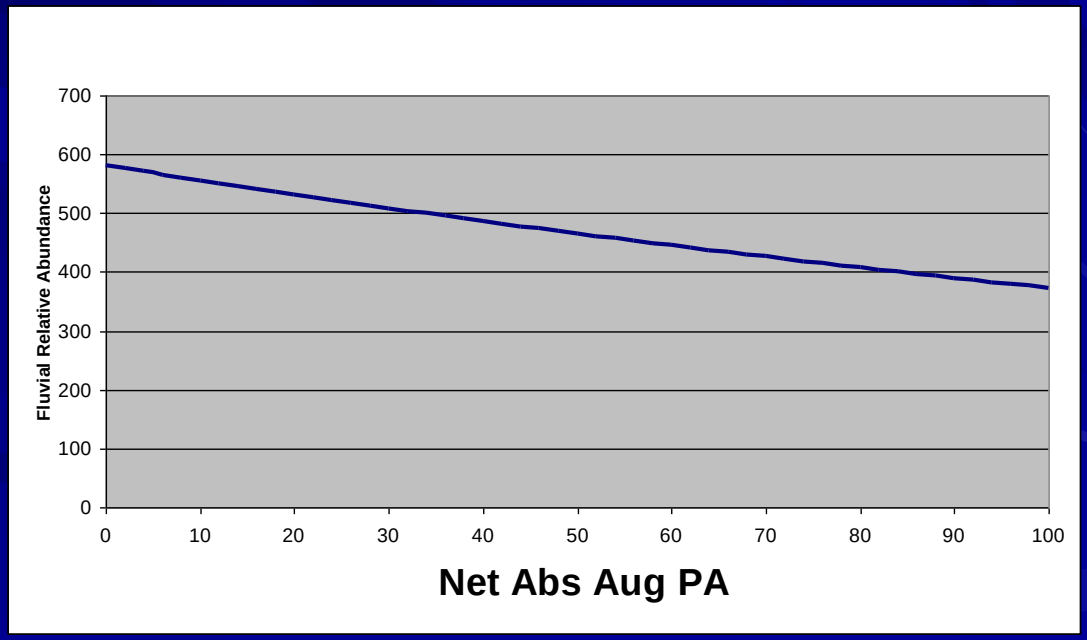
# Foundation: USGS Study
## Fluvial Fish Relative Abundance Model

- Benefits
  - Highly significant variables
  - Best Model that Included
    - Natural Basin Characteristics
    - Flow Alteration
    - Impervious Cover

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# Categories

- Categories are Narrow at low end of alteration – High quality resources have sensitive populations that respond more extensively to alteration
  - TITAN Analysis
  - Quantile Regression
- Categories are Broad at high end of alteration – Communities of more tolerant individuals remain, providing less change per unit alteration
  - GLM equation
  - Biological Conditions Gradient

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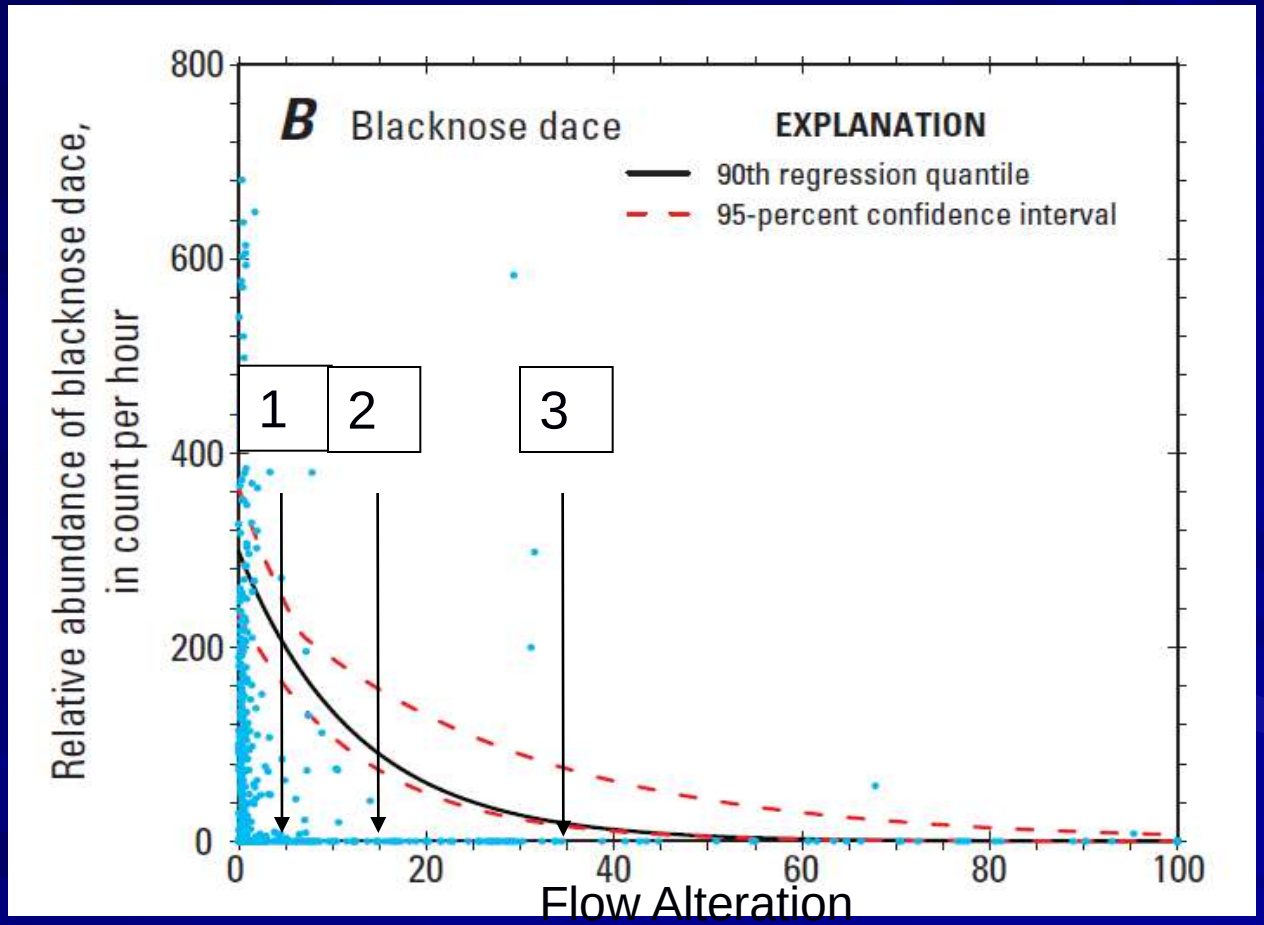


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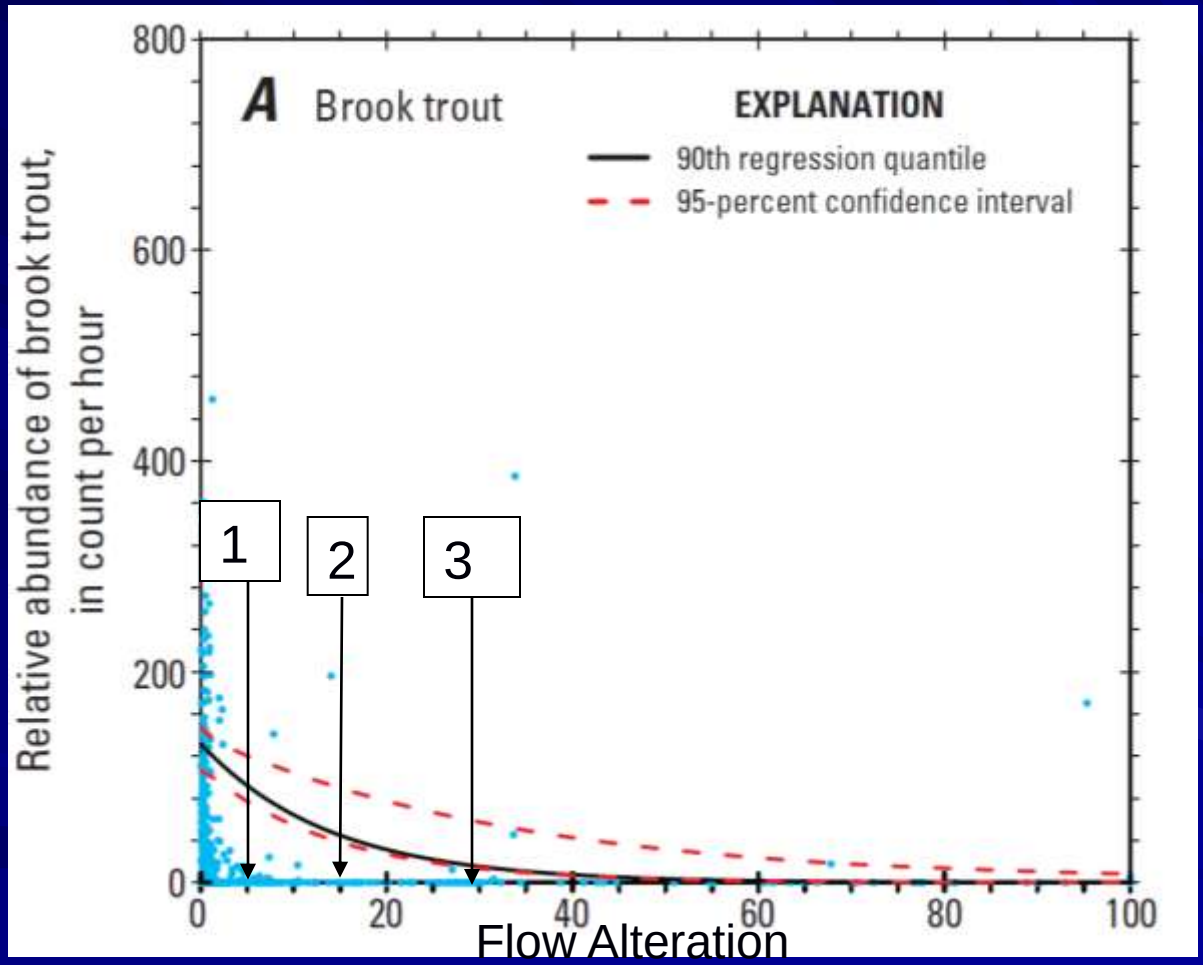


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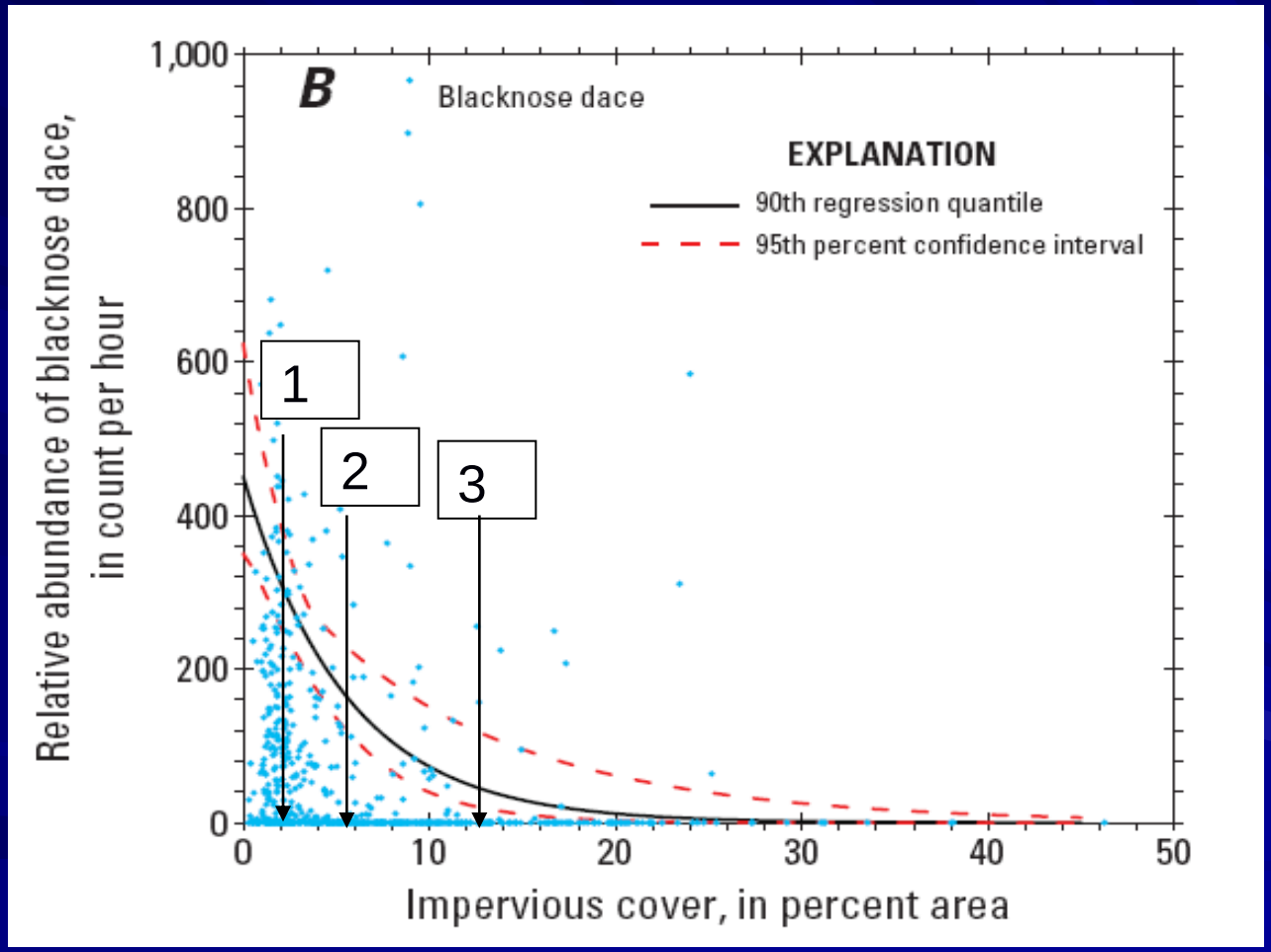
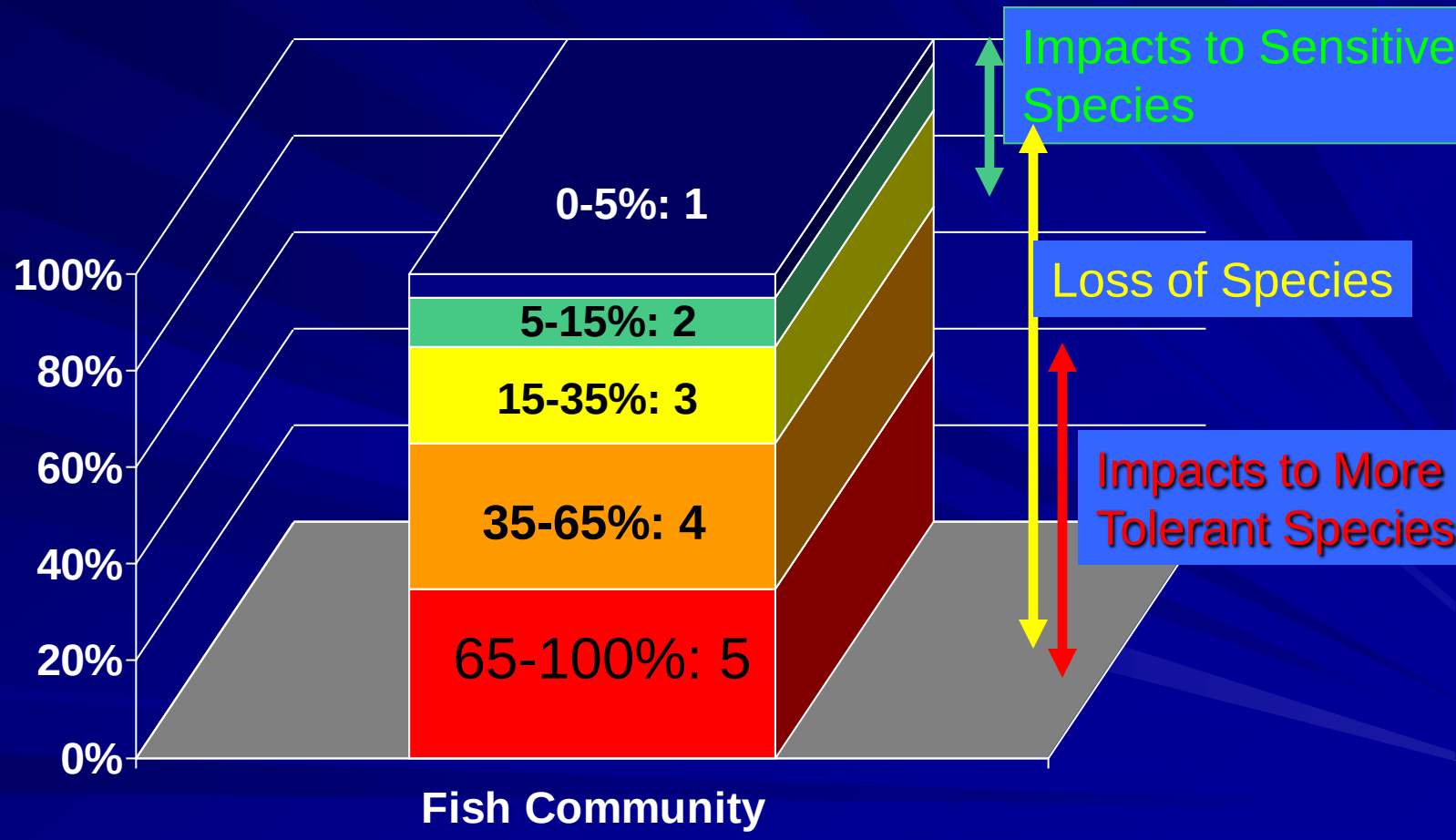
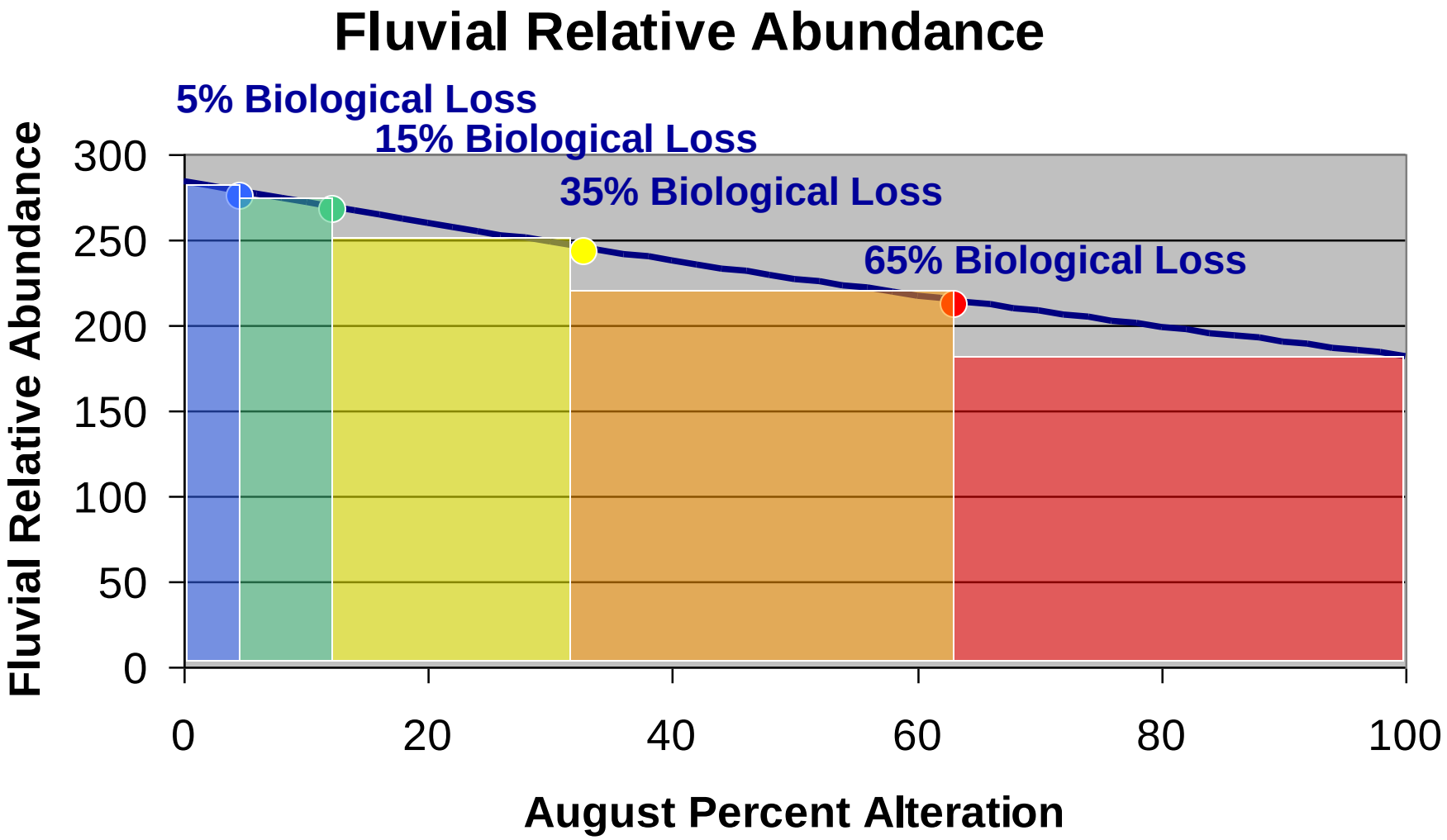

B
Blacknose dace
EXPLANATION
90th regression quantile
95th percent confidence interval
1
2
3
Relative abundance of blacknose dace, in count per hour
Impervious cover, in percent area
1,000
800
600
400
200
0
0
10
20
30
40
50

# Fish Community Response



# Baseline Condition

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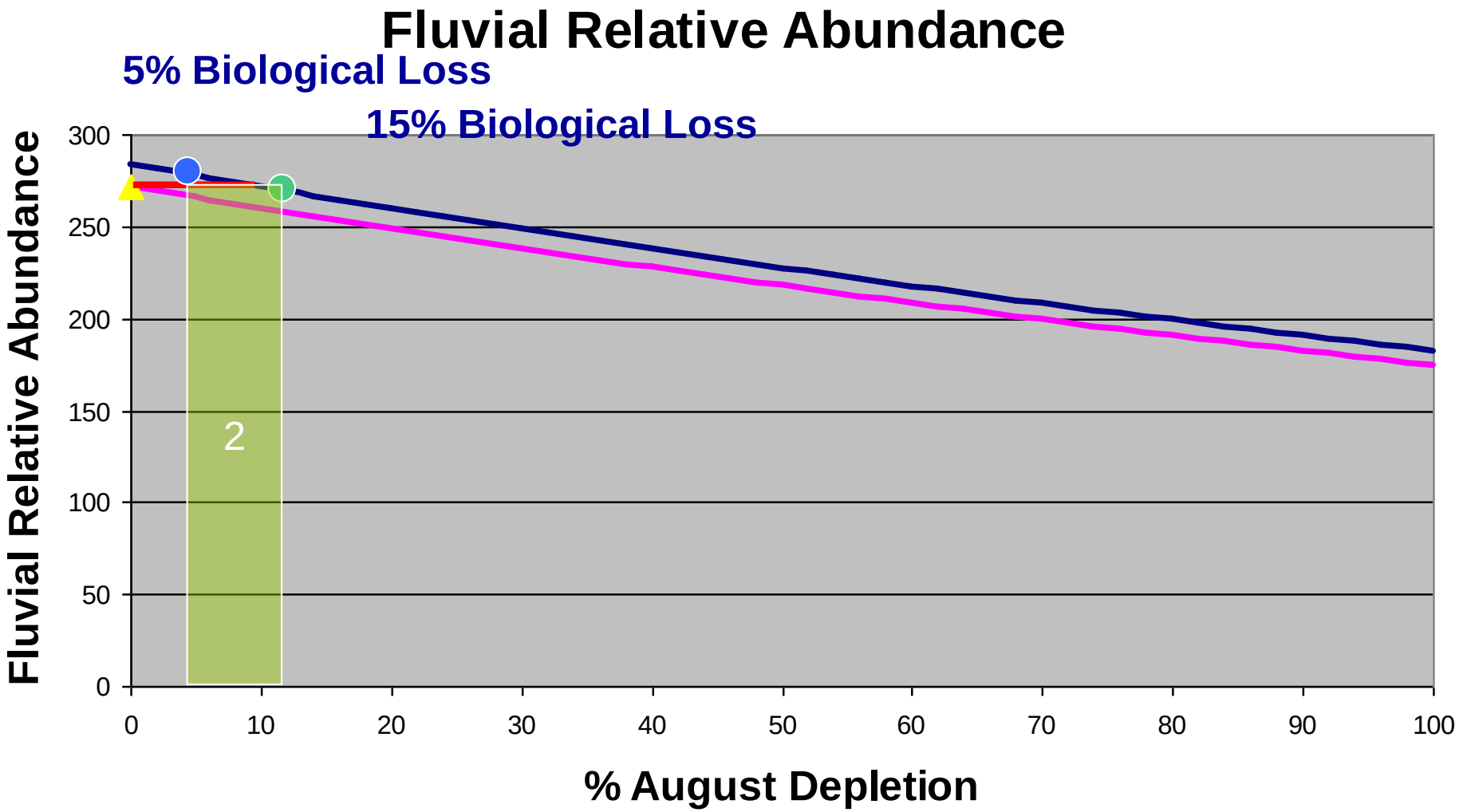
# Example Basin 11031




**Total % Biological Alteration = 13% (Category 2)**
**Alteration Due to IC = 12%**
**Alteration Due to August Alteration = 1%**

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# Basin-Specific Calculation

- Enter individual basin variables
- MWI 1429 Sub-basins
- Run Regression Equation

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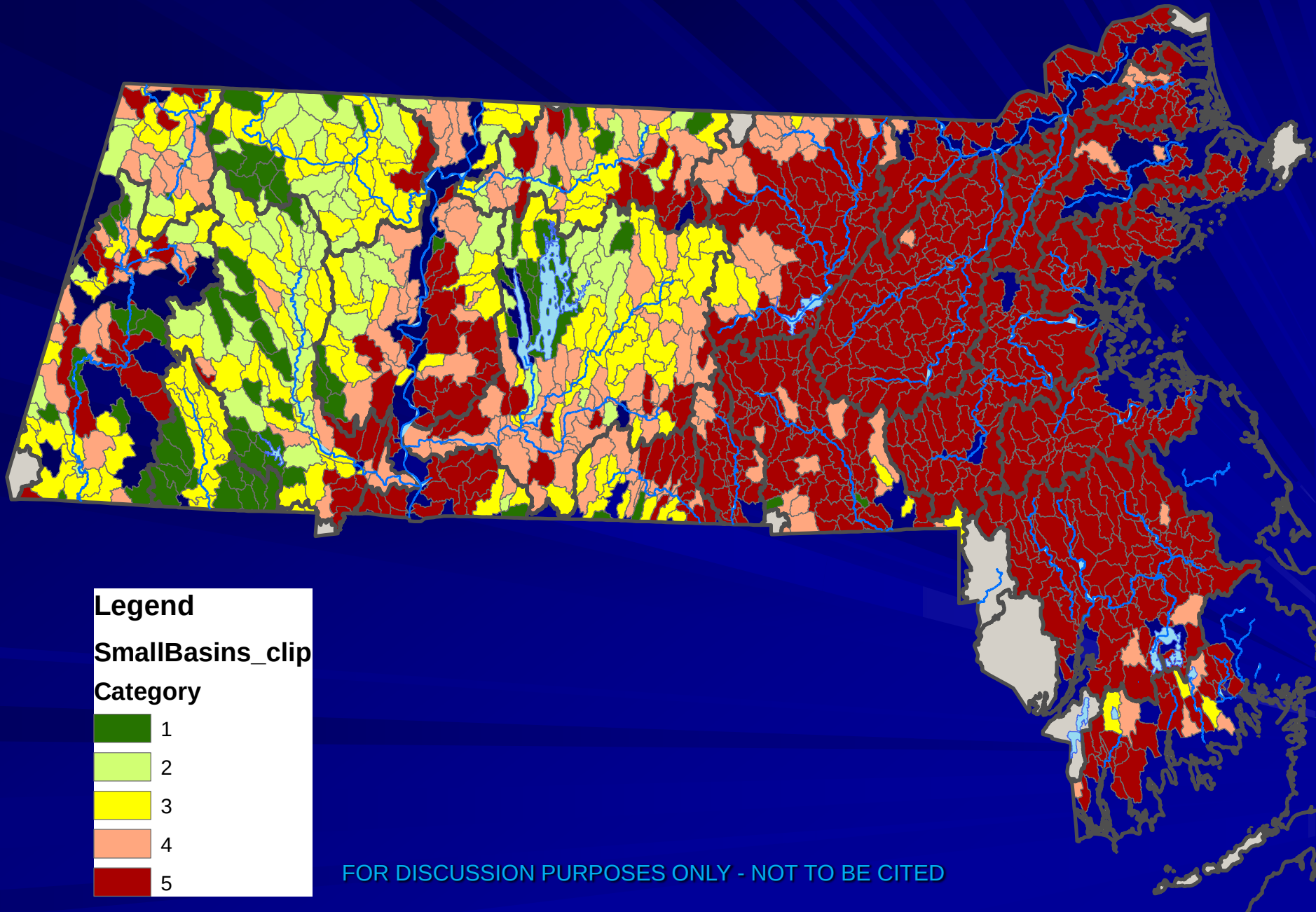


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